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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,513	06/09/2006	Takanori Yamagishi	292380US0PCT	2912
22850	7590	08/02/2007		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER EOFF, ANCA	
			ART UNIT	PAPER NUMBER
			1753	
			NOTIFICATION DATE	DELIVERY MODE
			08/02/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
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<b>Office Action Summary</b>	Application No. 10/582,513	Applicant(s) YAMAGISHI ET AL.	
	Examiner Anca Eoff	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 06/09/2006, 09/07/2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) 4-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>09/07/2006</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Status***

1. Claims 1-13 are pending in the application.

The foreign priority document has been received and acknowledged. However, certified English translation is required in order for the applicant to benefit of the earlier filing date of the Japanese application (JP 2003-413627).

### ***Claim Objections***

2. Claims 4-13 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 4-13 have not been further treated on the merits.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

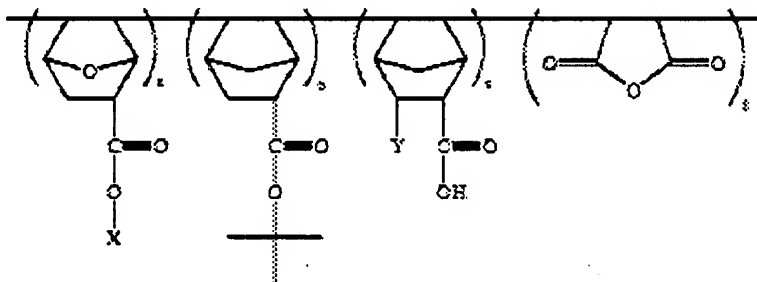
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Jung et al. (US Patent 6,150,069).

Jung et al. disclose photoresist compositions comprising the polymers and an organic solvent, wherein the polymers are represented by the formula (1):

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(1) (column 2, lines 54-56) with the substituents X and Y defined in column 2, lines 48-52.

The second repeating unit of the polymer (1) is equivalent to the repeating unit decomposable by the action of an acid of the instant application (since it is well known in the art that the t-butoxy carbonyl group is an acid labile-group as evidenced by Nishimura et al. (US Pg-Pub 2002/0009668) in par.0085.) *you could leave Nishimura out and refer to this as*

The third repeating unit of the polymer (1) is equivalent to the polar-group *inherency* containing repeating unit of the instant application.

Jung et al. further disclose that polymers of formula (1) are produced with purity of 99.9% (see Preparation Examples 8-10 in columns 10-12).

With regard to claim 2, Jung et al. further disclose that the organic solvent used for the photoresist composition may be cyclohexanone (column 7, lines 12-14), which has a boiling point of 155.6°C and a polar carbonyl group in the molecule.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

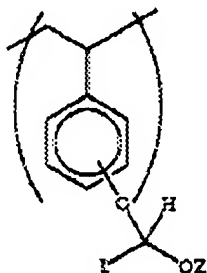
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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe et al. (US Pg-Pub 2001/0021479) in view of Tazaki et al. (US Patent 5,391,671)

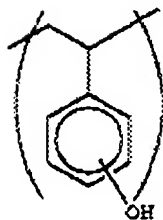
With regard to claim 1, Kawabe et al. disclose a positive photoresist composition comprising a resin (B), which is insoluble or sparingly soluble in alkali but becomes soluble in alkali by the action of an acid (abstract).

The resin (B) having the acid-decomposable group contains repeating units represented by the formula (2) and (3):



(2)

and



(3)

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(formulas (IV) and (V) in par.0113, where L represents a hydrogen atom, a straight chain, branched chain or cyclic alkyl which may be substituted or an aralkyl group which may be substituted; Z represents a straight chain, branched chain or cyclic alkyl group which may be substituted or an aralkyl group which may be substituted; or Z and L may be combined with each other to form a 5-membered or a 6-membered ring (par.0114)). In this case, the group represented by the formula (2) is equivalent to the repeating unit decomposable by the action of an acid and the group represented by the formula (3) is equivalent to the polar-group containing repeating unit of the instant application.

Kawabe et al. disclose methods of producing resins (B), said methods comprising steps of neutralizing the resin (B) with hydrochloric acid, filtration, washing with water, drying, precipitating three times with tetrahydrofuran and ultrapure water, drying in a vacuum drier (par.0192). However, Kawabe et al. fail to disclose the purity of the resin (B) obtained in the above-mentioned process.

Tazaki et al. disclose a process of fabrication of a styrene copolymer (column 6, line 46). In this process, after polymerization, the copolymer may be deashed (washed in accordance with known washing treatments) with a washing solution containing hydrochloric acid and, after washing, drying under pressure, the solubles may be removed by washing with a solvent such as methyl ethyl ketone or the like to obtain a styrene copolymer of high purity (column 10, lines 25-31).

Based on the disclosure of Tazaki et al, it is the examiner's position that the styrene copolymer (resin (B)) of Kawabe et al. is a copolymer of high purity since it is

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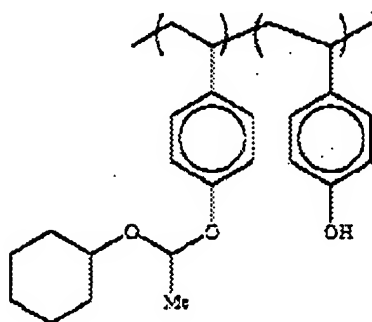
purified in a process comprising the same steps as the in the process of purification of Tazaki et al.

Kawabe et al. further disclose that the positive photoresist composition is dissolved in an appropriate solvent which can dissolve the components following by filtering through a filter having a pore size of 0.05  $\mu\text{m}$  to about 0.2  $\mu\text{m}$ , to prepare a solution if the photoresist composition, equivalent to the resist polymer solution of the instant application (par.0142). The solvents may be used individually or in combination of two or more thereof (par.0143).

Kawabe et al. also disclose that is preferred to reduce a impurity content, such as a metallic impurity and a chlorine ion in an amount of not more than 100 ppb (100 parts in  $10^9$  parts of photoresist composition) in the positive photoresist composition. If a large amount of impurity is present in the resist composition, defect or decrease of yield in the production of semiconductor device disadvantageously tends to occur (par.0144).

With regard to claim 2, Kawabe et al. disclose solvents having a boiling point at atmospheric pressure of 140°C or more and containing one or more polar groups, such as cyclohexanone, propylene glycol monomethyl ether acetate, ethyl lactate,  $\gamma$ -butyrolactone (par.0143).

With respect to claim 3, Kawabe et al. disclose a resin (B) represented by the formula (3):



(3)(compound (IV-9) in par.0132, where the repeating unit decomposable by the acid of an acid comprises a cyclohexyl substituent (alicyclic skeleton with 6 carbon atoms).

### **Conclusion**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anca Eoff whose telephone number is 571-272-9810.

The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business



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Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AE

*Cynthia A. Kelly*

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